

What Is Claimed Is:

1. A lens driving device, comprising:

a lens optical system having a moving lens group movable along a direction of an optical axis, the focal length of said lens optical system can be altered in stages among a plurality of values;

a moving lens group frame holding said moving lens group;

an aperture device provided within said lens optical system and modifying the aperture value;

a single driving source for changing the focal length value of said lens optical system and the aperture value of said aperture device; and,

a driving member driven by said single driving source and performing driving to change said moving lens group frame to a desired focal length value from one of said plurality of focal length values, and then performing driving to change the aperture value of said aperture device while maintaining the desired focal length value.

2. The lens driving device according to Claim 1, wherein said driving member includes:

a lens driving cam formed in sequential connection a first cam region which performs driving to displace said moving lens group frame in the optical axis direction, and a second cam region which does not perform driving to displace

said moving lens group frame in the optical axis direction;
and,

an aperture driving cam formed separately from said lens driving cam and performing driving to change the aperture value of said aperture device when said moving lens group frame is in a state of not being displaced in the optical axis direction due to said moving lens group frame being in said second cam region.

3. The lens driving device according to Claim 2,
wherein

said driving member is a cam ring of cylindrical shape, having a substantially uniform wall thickness; and,

said lens driving cam and said aperture driving cam are formed in this cylindrical-shape member as cam holes or as cam grooves.

4. The lens driving device according to Claim 2,
wherein

said aperture driving cam is formed such that the aperture value of said aperture device does not change within said first cam region in which there is driving displacement of said moving lens group frame in the optical axis direction.

5. The lens driving device according to Claim 2,
further comprising an impelling member, provided in said aperture device, which impels in a prescribed direction such

that the aperture value of said aperture device assumes a value determined in advance; and wherein

while in said first cam region in which said moving lens group frame is driven and displaced in the optical axis direction, said aperture value of said aperture device assumes the state of said value set in advance by means of the impelling force of said impelling member, without said aperture device being engaged with said aperture driving cam.

6. The lens driving device according to Claim 5, wherein said aperture device is impelled in the direction in which the aperture diameter is decreased.

7. The lens driving device according to Claim 1, wherein said driving member is formed such that, after said moving lens group frame is driven to be modified to a desired focal length value among said plurality of focal length values through driving, in one direction only, by said single driving source, said aperture device can be driven to modify the aperture value while maintaining the desired focal length value.

8. The lens driving device according to Claim 2, wherein said driving member is formed such that, after said moving lens group frame is driven to be modified to a desired focal length value among said plurality of focal length values through driving, in one direction only, by said single driving

source, said aperture device can be driven to modify the aperture value while maintaining the desired focal length value.

9. A lens driving device, comprising:

two or more moving lens group frames, each capable of different movement in the optical axis direction;

an aperture device provided in one of said moving lens group frames;

a cam member including at least two or more lens driving cam, each having a first cam portion and a second cam portion, said first cam portion and said second cam portion are formed successively to drive corresponding moving lens group, and a third cam portion formed separately from said driving cam;

said first cam portion in a range in which said moving lens group frames are driven and displaced in the optical axis direction;

said second cam portion in a range in which said moving lens group frames are not driven and displaced in the optical axis direction;

said third cam portion, which, when said moving lens group frames are in a state of not being displaced in the optical axis direction due to said moving lens group frames being in the range of said second cam portion, drives said aperture device to modify the aperture value; and,

a single driving source to drive said cam member in order to drive and displace said moving lens group frames and to drive said aperture device for changing an aperture value.

10. The lens driving device according to Claim 9, further comprising control means which controls the operation of said cam member driven by said driving source, to set the focal length obtained by movement of said moving lens group frames and the aperture of said aperture device to desired values.

11. The lens driving device according to Claim 9, wherein

said cam member is a cam ring of cylindrical shape, having a substantially uniform wall thickness; and,

said first cam portion, said second cam portion, and said third cam portion, are formed as cam holes or cam grooves in the cylindrical-shape cam member.

12. The lens driving device according to Claim 9, wherein

said third cam portion is formed such that the aperture value of said aperture device does not change while in said first cam portion in which there is driving to displace said moving lens group frames in the optical axis direction.

13. The lens driving device according to Claim 9, further comprising an impelling member, provided in said

aperture device, which impels in a prescribed direction such that the aperture value of said aperture device assumes a value determined in advance; and wherein

while in said first cam portion in which said moving lens group frame is driven and displaced in the optical axis direction, said aperture value of said aperture device assumes the state of said value set in advance by means of the impelling force of said impelling member, without said aperture device being engaged with said aperture driving cam.

14. The lens driving device according to Claim 9, wherein said aperture device is impelled in the direction in which the aperture diameter is decreased.

15. The lens driving device according to Claim 9, wherein said cam member is formed such that, after said lens optical system is driven to be modified to a desired focal length value among said plurality of focal length values through driving, in one direction only, by said single driving source, said aperture device can be driven to modify the aperture value while maintaining the desired focal length value.